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14. ABSTRACT Under a cooperative effort between General Atomics (GA), Tooele Army Depot (TEAD), the Defense Ammunition Center (DAC), the Air Force Research Laboratory (AFRL) at Tyndall AFB, and Joint Munitions Command (JMC), a Hydrolysis Production Prototype Plant (HPPP) is being constructed at TEAD. The major equipment items are scheduled for delivery to site early this summer. In addition, funding has been obtained to add a supercritical water oxidation (SCWO) unit at TEAD for processing of the HPPP hydrolysate. This new equipment will provide TEAD with the technology necessary to demil obsolete aluminum-bodied cartridge actuated devices (CADs) currently in storage at TEAD. CADs are compact, energetic containing devices commonly used on aircraft. There are over 15,000 tons of obsolete CADs and propellant actuated devices (PADs) in storage at various Army Ammunition Plants with the inventory growing daily. Currently, there is no effective way to demil these items which occupy approximately 60 storage bunkers at TEAD alone. The HPPP/SCWO systems will provide TEAD with the capability to begin working down that inventory, thus freeing up badly needed storage space at the depot.					
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CADs Hydrolysis/Supercritical Water Oxidation Prototype Demil Facility

by Jim Elliott, General Atomics, Jim Hurley, Stan Rising Tyndall AFB, Ron Snyder, Tooele Army Depot

Under a cooperative effort between General Atomics (GA), Tooele Army Depot (TEAD), the Defense Ammunition Center (DAC), the Air Force at Tyndall AFB (AF), and Joint Munitions Command (JMC), a Hydrolysis Production Prototype Plant (HPPP) is being constructed at TEAD. The major equipment items are scheduled for delivery to site early this summer. In addition, funding has been obtained to add a supercritical water oxidation (SCWO) unit at TEAD for processing of the HPPP hydrolysate. This new equipment will provide TEAD with the technology necessary to demil obsolete aluminum-bodied cartridge actuated devices (CADs) currently in storage at TEAD. CADs are compact, energetic containing devices commonly used on aircraft. There are over 15,000 tons of obsolete CADs and propellant actuated devices (PADs) in storage at various Army Ammunition Plants with the inventory growing daily. Currently there is no effective way to demil these items which occupy approximately 60 storage bunkers at TEAD alone. The HPPP/SCWO systems will provide TEAD with the capability to begin working down that inventory, thus freeing up badly needed storage space at the depot.

The prototype plant is being designed to process approximately two tons per day of CADs. The hydrolysis equipment will be located in Bldg. 1400 at TEAD. The graphic to the right shows the overall plant configuration. Work is on-going to modify TEADs permit to allow operation of the plant which has been designed to process ~2 tons/day of CADs. Major equipment items will be arriving on site for installation this summer. The design basis for the plant was developed from hydrolysis testing done on aluminum housed energetics under a DAC sponsored CADs demil test program completed in April 2003 and from hydrolysis testing performed under various Assembled Chemical Weapons Assessment (ACWA) projects. Design of the hydrolysis line uses technology common to the commercial plating industry. The plant will consist of a hydrolysis tank with four processing stations. Each processing station will accommodate one rotating basket. These baskets will be manually loaded with CADs and then remotely placed in the hydrolysis tank. As the basket rotates, the CADs (which are totally submerged in a caustic hydrolyzing solution) will be slowly tumbled through the solution for approximately two hours. At the completion of the processing time, the energetics and aluminum will

have been fully consumed by the warm NaOH solution. The baskets will then be remotely moved to a rinse tank where the remaining non-hydrolyzable "tramp" material will be rinsed with water. After rinsing, the tramp materials are manually unloaded from the basket for disposal off-site. The tramp materials (typically only a small fraction of the original CAD) consist of rubber, plastics and metal components unaffected by the hydrolysate process. The hydrolysate will initially be disposed at a licensed TSDF. Future plans include hydrolysate disposal through a SCWO system to be added next year.

General Atomics has completed the design of HPPP equipment and is now in the fabrication phase of the project with deliveries to the site scheduled for late spring/early summer. Site and infrastructure preparation is currently underway at TEAD. Equipment systemization with limited test operations are scheduled for the 4th quarter FY05 with production ramp up continuing throughout the remainder of the year. Once operational, it will be possible to perform hydrolysis demil testing on other types of aluminum bodied munitions, and potentially some non-aluminum bodied munitions thus expanding the range of munitions suitable for demil in the plant.

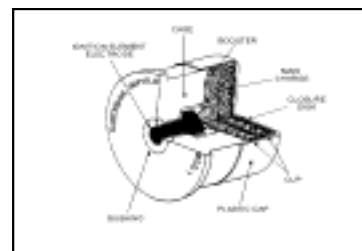


Figure 5. Typical CAD Configuration

Figure 6. Overall Plant Configuration